SEQUENCE LISTING

<110> Watkins, Jeffry D.
Huse, William D.
Tang, Ying

<120> Humanized Collagen Antibodies and
Related Methods

<130> P-IX 4976

<160> 358

<170> FastSEQ for Windows Version 4.0

<210> 1
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<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(339)

<400> 1

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Asp Ile Val Met Thr Gln Ser Pro Ser Leu Leu Ser Val Ser Ala Gly
 1               5                  10                  15

gag aag gtc act atg agc tgc aag tcc agt cag agt ctg tta aac agt   96
Glu Lys Val Thr Met Ser Cys Lys Ser Ser Gln Ser Leu Leu Asn Ser
            20                  25                  30

gga aat caa aag aac tac ttg gcc tgg tac cag cag aaa cca ggg cag   144
Gly Asn Gln Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
         35                  40                  45

cct cct aaa ctg ttg atc tat ggg gca tcc act agg gaa tct ggg gtc   192
Pro Pro Lys Leu Leu Ile Tyr Gly Ala Ser Thr Arg Glu Ser Gly Val
     50                  55                  60

cct gat cgc ttc aca ggc agt gga tct gga acc gat ttc act ctt atc   240
Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Ile
 65                  70                  75                  80

atc agc agt gtg cag gct gaa gac ctg gca gtt tat tac tgt cag aat   288
Ile Ser Ser Val Gln Ala Glu Asp Leu Ala Val Tyr Tyr Cys Gln Asn
                85                  90                  95

gat cat agt tat ccg tac acg ttc gga ggg ggg acc aag ctg gaa ata   336
Asp His Ser Tyr Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
            100                 105                 110

aaa                                                               339
Lys
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<210> 2
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<212> PRT
<213> Mus musculus

<400> 2

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Asp Ile Val Met Thr Gln Ser Pro Ser Leu Leu Ser Val Ser Ala Gly
 1               5                  10                  15
Glu Lys Val Thr Met Ser Cys Lys Ser Ser Gln Ser Leu Leu Asn Ser
            20                  25                  30
Gly Asn Gln Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
        35                  40                  45
Pro Pro Lys Leu Leu Ile Tyr Gly Ala Ser Thr Arg Glu Ser Gly Val
    50                  55                  60
Pro Asp Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Ile
65                  70                  75                  80
Ile Ser Ser Val Gln Ala Glu Asp Leu Ala Val Tyr Tyr Cys Gln Asn
                85                  90                  95
Asp His Ser Tyr Pro Tyr Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile
            100                 105                 110
Lys
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<210> 3
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<212> DNA
<213> Mus musculus

<220>
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<222> (1)...(360)

<400> 3

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Glu Val Lys Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1               5                  10                  15

tcc ctg aaa ctc tcc tgt gca gcc tca gga ttc gat ttt agt aga tac   96
Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Arg Tyr
            20                  25                  30

tgg atg agt tgg gtc cgg cag gct cca ggg aaa ggg cta gaa tgg att   144
Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
        35                  40                  45

gga gaa att aat cca gat agc agt acg ata aac tat acg cca tct cta   192
Gly Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu
    50                  55                  60

aag gat aaa ttc atc atc tcc aga gac aac gcc aaa aat acg ctg tac   240
Lys Asp Lys Phe Ile Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
65                  70                  75                  80
```

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ctg caa atg agc aaa gtg aga tct gag gac aca gcc ctt tat tac tgt   288
Leu Gln Met Ser Lys Val Arg Ser Glu Asp Thr Ala Leu Tyr Tyr Cys
                85                  90                  95

gca aga ccg gtt gat ggt tac tac gat gct atg gac tac tgg ggt caa   336
Ala Arg Pro Val Asp Gly Tyr Tyr Asp Ala Met Asp Tyr Trp Gly Gln
            100                 105                 110

gga acc tca gtc acc gtc tcc tca                                  360
Gly Thr Ser Val Thr Val Ser Ser
        115                 120
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<210> 4
<211> 120
<212> PRT
<213> Mus musculus

<400> 4

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Glu Val Lys Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1               5                  10                  15
Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Arg Tyr
            20                  25                  30
Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
        35                  40                  45
Gly Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu
    50                  55                  60
Lys Asp Lys Phe Ile Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
65                  70                  75                  80
Leu Gln Met Ser Lys Val Arg Ser Glu Asp Thr Ala Leu Tyr Tyr Cys
                85                  90                  95
Ala Arg Pro Val Asp Gly Tyr Tyr Asp Ala Met Asp Tyr Trp Gly Gln
            100                 105                 110
Gly Thr Ser Val Thr Val Ser Ser
        115                 120
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<210> 5
<211> 305
<212> DNA
<213> Homo sapiens

<400> 5

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gac atc gtg atg acc cag tct cca gac tcc ctg gct gtg tct ctg ggc    48
gag agg gcc acc atc aac tgc aag tcc agc cag agt gtt tta tac agc    96
tcc aac aat aag aac tac tta gct tgg tac cag cag aaa cca gga cag   144
cct cct aag ctg ctc att tac tgg gca tct acc cgg gaa tcc ggg gtc   192
cct gac cga ttc agt ggc agc ggg tct ggg aca gat ttc act ctc acc   240
atc agc agc ctg cag gct gaa gat gtg gca gtt tat tac tgt cag caa   288
tat tat agt act cct cc                                           305
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<210> 6
<211> 113
<212> PRT

<213> Homo sapiens

<400> 6

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Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ala Val Ser Leu Gly
 1               5                  10                  15
Glu Arg Ala Thr Ile Asn Cys Lys Ser Ser Gln Ser Val Leu Tyr Ser
            20                  25                  30
Ser Asn Asn Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
        35                  40                  45
Pro Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
    50                  55                  60
Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
65                  70                  75                  80
Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys Gln Gln
                85                  90                  95
Asp His Ser Tyr Pro Tyr Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile
            100                 105                 110
Lys
```

<210> 7
<211> 294
<212> DNA
<213> Homo sapiens

<400> 7

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gag gtg cag ctg gtg gag tct ggg gga ggc ttg gtc cag cct ggg ggg   48
tcc ctg aga ctc tcc tgt gca gcc tct gga ttc acc ttt agt agc tat   96
tgg atg agc tgg gtc cgc cag gct cca ggg aag ggg ctg gag tgg gtg   144
gcc aac ata aag caa gat gga agt gag aaa tac tat gtg gac tct gtg   192
aag ggc cga ttc acc atc tcc aga gac aac gcc aag aac tca ctg tat   240
ctg caa atg aac agc ctg aga gcc gag gac acg gct gtg tat tac tgt   288
gcg aga                                                         294
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<210> 8
<211> 120
<212> PRT
<213> Homo sapiens

<400> 8

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Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1               5                  10                  15
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
            20                  25                  30
Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
        35                  40                  45
Ala Asn Ile Lys Gln Asp Gly Ser Glu Lys Tyr Tyr Val Asp Ser Val
    50                  55                  60
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
65                  70                  75                  80
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
                85                  90                  95
Ala Arg Pro Asp Tyr Tyr Tyr Tyr Tyr Gly Met Asp Val Trp Gly Gln
            100                 105                 110
```

```
Gly Thr Thr Val Thr Val Ser Ser
        115                 120


<210> 9
<211> 336
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(336)

<400> 9
gat gtt ttg atg acc caa act cca ctc tcc ctg cct gtc agt ctt gga   48
Asp Val Leu Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
 1               5                  10                  15

gat caa gcc tcc atc tct tgc aga tct agt cag agc att gta cat agt   96
Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
             20                  25                  30

aat gga aac acc tat tta gaa tgg tac ctg cag aaa cca ggc cag tct   144
Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
         35                  40                  45

cca aag ctc ctg atc tac aaa gtt tcc aac cga ttt tct ggt gtc cca   192
Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
     50                  55                  60

gac agg ttc agt ggc agt gga tca ggg aca gat ttc aca ctc aag atc   240
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
 65                  70                  75                  80

agc aga gtg gag gct gag gat ctg gga gtt tat tac tgc ttt caa ggt   288
Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
                 85                  90                  95

tca cat gtt ccg tgg acg ttc ggt gga ggc acc aag ctg gaa atc aaa   336
Ser His Val Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110


<210> 10
<211> 112
<212> PRT
<213> Mus musculus

<400> 10
Asp Val Leu Met Thr Gln Thr Pro Leu Ser Leu Pro Val Ser Leu Gly
 1               5                  10                  15
Asp Gln Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Ile Val His Ser
            20                  25                  30
Asn Gly Asn Thr Tyr Leu Glu Trp Tyr Leu Gln Lys Pro Gly Gln Ser
```

```
        35                  40                  45
Pro Lys Leu Leu Ile Tyr Lys Val Ser Asn Arg Phe Ser Gly Val Pro
    50                  55                  60
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65                  70                  75                  80
Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Tyr Cys Phe Gln Gly
                85                  90                  95
Ser His Val Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
            100                 105                 110


<210> 11
<211> 369
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(369)

<400> 11
cag gtt act ctg aaa gag act ggc cct ggg ata ttg cag ccc tcc cag   48
Gln Val Thr Leu Lys Glu Thr Gly Pro Gly Ile Leu Gln Pro Ser Gln
 1               5                  10                  15

acc ctc agt ctg act tgt tct ttc tct ggg ttt tca ctg agc act tct   96
Thr Leu Ser Leu Thr Cys Ser Phe Ser Gly Phe Ser Leu Ser Thr Ser
            20                  25                  30

ggt atg ggt gta ggc tgg att cgt cag cct tca gga gag ggt cta gag   144
Gly Met Gly Val Gly Trp Ile Arg Gln Pro Ser Gly Glu Gly Leu Glu
        35                  40                  45

tgg ctg gca gac att tgg tgg gat gac aat aag tac tat aac cca tcc   192
Trp Leu Ala Asp Ile Trp Trp Asp Asp Asn Lys Tyr Tyr Asn Pro Ser
    50                  55                  60

ctg aag agc cgg ctc aca atc tcc aag gat acc tcc agc aac cag gta   240
Leu Lys Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Ser Asn Gln Val
65                  70                  75                  80

ttc ctc aag atc acc agt gtg gac act gca gat act gcc act tac tac   288
Phe Leu Lys Ile Thr Ser Val Asp Thr Ala Asp Thr Ala Thr Tyr Tyr
                85                  90                  95

tgt gct cga aga gct aac tat ggt aac ccc tac tat gct atg gac tac   336
Cys Ala Arg Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
            100                 105                 110

tgg ggt caa gga acc tca gtc acc gtc tcc tca                      369
Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
        115                 120


<210> 12
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<211> 123
<212> PRT
<213> Mus musculus

<400> 12
Gln Val Thr Leu Lys Glu Thr Gly Pro Gly Ile Leu Gln Pro Ser Gln
 1   5   10   15
Thr Leu Ser Leu Thr Cys Ser Phe Ser Gly Phe Ser Leu Ser Thr Ser
            20   25   30
Gly Met Gly Val Gly Trp Ile Arg Gln Pro Ser Gly Glu Gly Leu Glu
        35   40   45
Trp Leu Ala Asp Ile Trp Trp Asp Asp Asn Lys Tyr Tyr Asn Pro Ser
    50   55   60
Leu Lys Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Ser Asn Gln Val
65   70   75   80
Phe Leu Lys Ile Thr Ser Val Asp Thr Ala Asp Thr Ala Thr Tyr Tyr
                85   90   95
Cys Ala Arg Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
            100   105   110
Trp Gly Gln Gly Thr Ser Val Thr Val Ser Ser
        115   120

<210> 13
<211> 305
<212> DNA
<213> Homo sapiens

<400> 13
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gag ccg gcc tcc atc tcc tgc agg tct agt cag agc ctc ttg gat agt   96
gat gat gga aac acc tat ttg gac tgg tac ctg cag aag cca ggg cag   144
tct cca cag ctc ctg atc tat acg ctt tcc tat cgg gcc tct gga gtc   192
cca gac agg ttc agt ggc agt ggg tca ggc act gat ttc aca ctg aaa   240
atc agc agg gtg gag gct gag gat gtt gga gtt tat tac tgc atg caa   288
cgt ata gag ttt cct tc   305

<210> 14
<211> 111
<212> PRT
<213> Homo sapiens

<400> 14
Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Thr Pro Gly
 1   5   10   15
Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu Asp Ser
            20   25   30
Asp Gly Asn Thr Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln Ser
        35   40   45
Pro Gln Leu Leu Ile Tyr Thr Leu Ser Tyr Arg Ala Ser Gly Val Pro
    50   55   60
Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65   70   75   80
Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln Ser
                85   90   95

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His Val Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
            100                 105                 110


<210> 15
<211> 288
<212> DNA
<213> Homo sapiens

<400> 15
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acctgcacct tctctgggtt ctcactcagc actagtggaa tgcgtgtgag ctggatccgt 120
cagcccccag ggaaggccct ggagtggctt gcacgcattg attggg atg atg ata    175
aat tct aca gca cat ctc tga agaccaggct caccatctcc aaggacacct      226
ccaaaaacca ggtggtcctt acaatgacca acatggaccc tgtggacaca gccacgtatt 286
ac                                                                288

<210> 16
<211> 123
<212> PRT
<213> Homo sapiens

<400> 16
Gln Val Thr Leu Lys Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln
 1               5                  10                  15
Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Ser Thr Ser
            20                  25                  30
Gly Met Arg Val Ser Trp Ile Arg Gln Pro Pro Gly Lys Ala Leu Glu
        35                  40                  45
Trp Leu Ala Arg Ile Asp Trp Asp Asp Asp Lys Phe Tyr Ser Thr Ser
    50                  55                  60
Leu Lys Thr Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val
65                  70                  75                  80
Val Leu Thr Met Thr Asn Met Asp Pro Val Asp Thr Ala Thr Tyr Tyr
                85                  90                  95
Cys Ala Arg Arg Ala Asn Tyr Tyr Tyr Tyr Tyr Tyr Ala Met Asp Val
            100                 105                 110
Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
        115                 120


<210> 17
<211> 340
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (1)...(339)

<400> 17
gat att gtg atg acc cag act cca ctc tcc ctg ccc gtc acc cct gga   48
Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Thr Pro Gly
 1               5                  10                  15
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```
gag ccg gcc tcc atc tcc tgc agg tct agt cag agc ctc ttg gat agt   96
Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu Asp Ser
            20                  25                  30

gat gat gga aac acc tat ttg gac tgg tac ctg cag aag cca ggg cag   144
Asp Asp Gly Asn Thr Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln
        35                  40                  45

tct cca cag ctc ctg atc tat acg ctt tcc tat cgg gcc tct gga gtc   192
Ser Pro Gln Leu Leu Ile Tyr Thr Leu Ser Tyr Arg Ala Ser Gly Val
    50                  55                  60

cca gac agg ttc agt ggc agt ggg tca ggc act gat ttc aca ctg aaa   240
Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys
65                  70                  75                  80

atc agc agg gtg gag gct gag gat gtt gga gtt tat tac tgc atg caa   288
Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln
                85                  90                  95

cgg ttc aca tgt tcc gtg gac gtt cgg cca agg gac caa ggt gga aat   336
Arg Phe Thr Cys Ser Val Asp Val Arg Pro Arg Asp Gln Gly Gly Asn
            100                 105                 110

caa a                                                            340
Gln
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<210> 18
<211> 113
<212> PRT
<213> Homo sapiens

<400> 18

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Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Thr Pro Gly
 1               5                  10                  15
Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Leu Asp Ser
            20                  25                  30
Asp Asp Gly Asn Thr Tyr Leu Asp Trp Tyr Leu Gln Lys Pro Gly Gln
        35                  40                  45
Ser Pro Gln Leu Leu Ile Tyr Thr Leu Ser Tyr Arg Ala Ser Gly Val
    50                  55                  60
Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys
65                  70                  75                  80
Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr Cys Met Gln
                85                  90                  95
Arg Phe Thr Cys Ser Val Asp Val Arg Pro Arg Asp Gln Gly Gly Asn
            100                 105                 110
Gln
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<210> 19
<211> 51

<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(51)

<400> 19
aag tcc agt cag agt ctg tta aac agt gga aat caa aag aac tac ttg 48
Lys Ser Ser Gln Ser Leu Leu Asn Ser Gly Asn Gln Lys Asn Tyr Leu
 1   5   10   15

gcc 51
Ala

<210> 20
<211> 17
<212> PRT
<213> Mus musculus

<400> 20
Lys Ser Ser Gln Ser Leu Leu Asn Ser Gly Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 21
<211> 21
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(21)

<400> 21
ggg gca tcc act agg gaa tct 21
Gly Ala Ser Thr Arg Glu Ser
 1   5

<210> 22
<211> 7
<212> PRT
<213> Mus musculus

<400> 22
Gly Ala Ser Thr Arg Glu Ser
 1   5

<210> 23

<211> 27
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(27)

<400> 23
cag aat gat cat agt tat ccg tac acg 27
Gln Asn Asp His Ser Tyr Pro Tyr Thr
1 5

<210> 24
<211> 9
<212> PRT
<213> Mus musculus

<400> 24
Gln Asn Asp His Ser Tyr Pro Tyr Thr
1 5

<210> 25
<211> 30
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(30)

<400> 25
gga ttc gat ttt agt aga tac tgg atg agt 30
Gly Phe Asp Phe Ser Arg Tyr Trp Met Ser
1 5 10

<210> 26
<211> 10
<212> PRT
<213> Mus musculus

<400> 26
Gly Phe Asp Phe Ser Arg Tyr Trp Met Ser
1 5 10

<210> 27
<211> 51
<212> DNA
<213> Mus musculus

<220>

<221> CDS
<222> (1)...(51)

<400> 27
gaa att aat cca gat agc agt acg ata aac tat acg cca tct cta aag 48
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu Lys
1 5 10 15

gat 51
Asp

<210> 28
<211> 17
<212> PRT
<213> Mus musculus

<400> 28
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu Lys
1 5 10 15
Asp

<210> 29
<211> 33
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(33)

<400> 29
ccg gtt gat ggt tac tac gat gct atg gac tac 33
Pro Val Asp Gly Tyr Tyr Asp Ala Met Asp Tyr
1 5 10

<210> 30
<211> 11
<212> PRT
<213> Mus musculus

<400> 30
Pro Val Asp Gly Tyr Tyr Asp Ala Met Asp Tyr
1 5 10

<210> 31
<211> 48
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(48)

<400> 31
aga tct agt cag agc att gta cat agt aat gga aac acc tat tta gaa 48
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Asn Thr Tyr Leu Glu
 1 5 10 15

<210> 32
<211> 16
<212> PRT
<213> Mus musculus

<400> 32
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Asn Thr Tyr Leu Glu
 1 5 10 15

<210> 33
<211> 21
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(21)

<400> 33
aaa gtt tcc aac cga ttt tct 21
Lys Val Ser Asn Arg Phe Ser
 1 5

<210> 34
<211> 7
<212> PRT
<213> Mus musculus

<400> 34
Lys Val Ser Asn Arg Phe Ser
 1 5

<210> 35
<211> 27
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(27)

<400> 35
ttt caa ggt tca cat gtt ccg tgg acg 27
Phe Gln Gly Ser His Val Pro Trp Thr
1 5

<210> 36
<211> 9
<212> PRT
<213> Mus musculus

<400> 36
Phe Gln Gly Ser His Val Pro Trp Thr
1 5

<210> 37
<211> 36
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(36)

<400> 37
ggg ttt tca ctg agc act tct ggt atg ggt gta ggc 36
Gly Phe Ser Leu Ser Thr Ser Gly Met Gly Val Gly
1 5 10

<210> 38
<211> 12
<212> PRT
<213> Mus musculus

<400> 38
Gly Phe Ser Leu Ser Thr Ser Gly Met Gly Val Gly
1 5 10

<210> 39
<211> 48
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(48)

<400> 39
gac att tgg tgg gat gac aat aag tac tat aac cca tcc ctg aag agc 48
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 40
<211> 16
<212> PRT
<213> Mus musculus

<400> 40
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Tyr Asn Pro Ser Leu Lys Ser
 1   5   10   15

<210> 41
<211> 39
<212> DNA
<213> Mus musculus

<220>
<221> CDS
<222> (1)...(39)

<400> 41
aga gct aac tat ggt aac ccc tac tat gct atg gac tac   39
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
 1   5   10

<210> 42
<211> 13
<212> PRT
<213> Mus musculus

<400> 42
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
 1   5   10

<210> 43
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 43
Gly Phe Asp Phe Ser His Tyr Trp Met Ser
 1   5   10

<210> 44
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 44
Gly Phe Asp Phe Ser Arg Tyr Trp Ile Ser
 1   5   10

<210> 45
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 45
Gly Phe Asp Phe Ser Arg Tyr Trp Met Thr
 1   5   10

<210> 46
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 46
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 1   5   10

<210> 47
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Artificial sequence

<400> 47
Gly Phe Asp Phe Ser Arg Tyr Trp Met Gly
 1   5   10

<210> 48
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Artificial sequence

<400> 48
Glu Ile Asn Pro Asp Ser Ser Thr Ala Asn Tyr Thr Pro Ser Leu Lys
1 5 10 15
Asp

<210> 49
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Artificial sequence

<400> 49
Glu Ile Asn Pro Asp Ser Ser Thr Ser Asn Tyr Thr Pro Ser Leu Asp
1 5 10 15
Lys

<210> 50
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Artificial sequence

<400> 50
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Tyr Leu Lys
1 5 10 15
Asp

<210> 51
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
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<400> 51
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ala Leu Lys
1 5 10 15
Asp

<210> 52
<211> 17
<212> PRT

<213> Artificial Sequence

<220>
<223> Artificial sequence

<400> 52
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro His Leu Lys
 1   5   10   15
Asp

<210> 53
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 53
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Gly Leu Lys
 1   5   10   15
Asp

<210> 54
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 54
Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu Gln
 1   5   10   15
Asp

<210> 55
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
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<400> 55
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 1   5   10   15
Ser

<210> 56
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
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<400> 56
Pro Val Pro Gly Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 57
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 57
Pro Val Gly Gly Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 58
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 58
Pro Val Thr Gly Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 59
<211> 11
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<220>
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<400> 59
Pro Val Ala Gly Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 60

<211> 11
<212> PRT
<213> Artificial Sequence

<220>
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<400> 60
Pro Val Asp Pro Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 61
<211> 11
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<213> Artificial Sequence

<220>
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<400> 61
Pro Val Asp Ala Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 62
<211> 11
<212> PRT
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<220>
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<400> 62
Pro Val Asp His Tyr Tyr Asp Ala Met Asp Tyr
 1   5   10

<210> 63
<211> 11
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<220>
<223> synthetic antibody mutation

<400> 63
Pro Val Asp Gly Tyr Tyr Asp Ala Met Asp Pro
 1   5   10

<210> 64
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
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<400> 64
Pro Val Asp Gly Tyr Tyr Asp Ala Met Asp Asn
 1   5   10

<210> 65
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 65
Lys Ser Ser Arg Ser Leu Leu Asn Ser Gly Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 66
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
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<400> 66
Lys Ser Ser Ser Ser Leu Leu Asn Ser Gly Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 67
<211> 17
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<220>
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<400> 67
Lys Ser Ser Gln Ser Leu Leu Ser Ser Gly Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 68

<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 68
Lys Ser Ser Gln Ser Leu Leu Asn Tyr Gly Asn Gln Lys Asn Tyr Leu
1 5 10 15
Ala

<210> 69
<211> 17
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<213> Artificial Sequence

<220>
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<400> 69
Lys Ser Ser Gln Ser Leu Leu Asn Trp Gly Asn Gln Lys Asn Tyr Leu
1 5 10 15
Ala

<210> 70
<211> 17
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<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 70
Lys Ser Ser Gln Ser Leu Leu Asn His Gly Asn Gln Lys Asn Tyr Leu
1 5 10 15
Ala

<210> 71
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<400> 71
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1 5 10 15

Ala

<210> 72
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<400> 72
Lys Ser Ser Gln Ser Leu Leu Asn Ser Tyr Asn Gln Lys Asn Tyr Leu
1 5 10 15
Ala

<210> 73
<211> 17
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<220>
<223> synthetic antibody mutation

<400> 73
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1 5 10 15
Ala

<210> 74
<211> 17
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<220>
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<400> 74
Lys Ser Ser Gln Ser Leu Leu Asn Ser His Asn Gln Lys Asn Tyr Leu
1 5 10 15
Ala

<210> 75
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<213> Artificial Sequence

<220>

<223> synthetic antibody mutation

<400> 75
Lys Ser Ser Gln Ser Leu Leu Asn Ser Ile Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 76
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 76
Lys Ser Ser Gln Ser Leu Leu Asn Ser Gly Asn Lys Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 77
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<220>
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<400> 77
Gln Asn Asp His Gln Tyr Pro Tyr Thr
 1   5

<210> 78
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 78
Gln Asn Asp His Gly Tyr Pro Tyr Thr
 1   5

<210> 79
<211> 9
<212> PRT
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<220>
<223> synthetic antibody mutation

<400> 79
Gln Asn Asp His Leu Tyr Pro Tyr Thr
 1   5

<210> 80
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<400> 80
Gln Asn Asp His Ala Tyr Pro Tyr Thr
 1   5

<210> 81
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<220>
<223> synthetic antibody mutation

<400> 81
Gln Asn Asp His Thr Tyr Pro Tyr Thr
 1   5

<210> 82
<211> 9
<212> PRT
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<220>
<223> synthetic antibody mutation

<400> 82
Gln Asn Asp His Val Tyr Pro Tyr Thr
 1   5

<210> 83
<211> 9
<212> PRT
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<220>
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<400> 83
Gln Asn Asp His Ser Asn Pro Tyr Thr
 1   5

<210> 84
<211> 9
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<220>
<223> synthetic antibody mutation

<400> 84
Gln Asn Asp His Ser Ser Pro Tyr Thr
 1   5

<210> 85
<211> 9
<212> PRT
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<220>
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<400> 85
Gln Asn Asp His Ser Pro Pro Tyr Thr
 1   5

<210> 86
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<220>
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<400> 86
Gln Asn Asp His Ser Met Pro Tyr Thr
 1   5

<210> 87
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<220>
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<400> 87
Gly Phe Ser Leu Ser Thr Pro Gly Met Gly Val Gly
 1   5   10

<210> 88
<211> 12
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<400> 88
Gly Phe Ser Leu Ser Thr Trp Gly Met Gly Val Gly
 1   5   10

<210> 89
<211> 12
<212> PRT
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<400> 89
Gly Phe Ser Leu Ser Thr Ser Gly Met Gly Val Trp
 1   5   10

<210> 90
<211> 12
<212> PRT
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<400> 90
Gly Phe Ser Leu Ser Thr Ser Gly Met Gly Val Leu
 1   5   10

<210> 91
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<212> PRT
<213> Artificial Sequence

<220>
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<400> 91
Gly Phe Ser Leu Ser Thr Ser Gly Met Gly Val Ala
 1   5   10

<210> 92

<211> 16
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<220>
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<400> 92
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Ser Asn Pro Ser Leu Lys Ser
 1   5   10   15

<210> 93
<211> 16
<212> PRT
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<220>
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<400> 93
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Ala Asn Pro Ser Leu Lys Ser
 1   5   10   15

<210> 94
<211> 16
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<220>
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<400> 94
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Pro Asn Pro Ser Leu Lys Ser
 1   5   10   15

<210> 95
<211> 16
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<220>
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<400> 95
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Tyr Asn Pro Ser Leu Pro Ser
 1   5   10   15

<210> 96
<211> 13
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<220>
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<400> 96
Pro Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
 1   5   10

<210> 97
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<400> 97
Gln Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
 1   5   10

<210> 98
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<400> 98
Leu Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
 1   5   10

<210> 99
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<400> 99
Thr Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
 1   5   10

<210> 100
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Val Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Tyr
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<210> 101
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<400> 101
Arg Ala Asn Tyr Gly Val Pro Tyr Tyr Ala Met Asp Tyr
1 5 10

<210> 102
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<400> 102
Arg Ala Asn Tyr Gly Trp Pro Tyr Tyr Ala Met Asp Tyr
1 5 10

<210> 103
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<400> 103
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Gln Asp Tyr
1 5 10

<210> 104
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<400> 104
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Asn Asp Tyr

1 5 10

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<400> 105
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Thr Asp Tyr
1 5 10

<210> 106
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<400> 106
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Lys
1 5 10

<210> 107
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<400> 107
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Thr
1 5 10

<210> 108
<211> 13
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<400> 108
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp Met
1 5 10

<210> 109
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<400> 109
Arg Ala Asn Tyr Gly Asn Pro Tyr Tyr Ala Met Asp His
1 5 10

<210> 110
<211> 16
<212> PRT
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<220>
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<400> 110
Arg Ser Ser Gln Ser Ile Pro His Ser Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 111
<211> 16
<212> PRT
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<220>
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<400> 111
Arg Ser Ser Gln Ser Ile Trp His Ser Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 112
<211> 16
<212> PRT
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<220>
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<400> 112
Arg Ser Ser Gln Ser Ile Val Leu Ser Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 113
<211> 16
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<213> Artificial Sequence

<220>
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<400> 113
Arg Ser Ser Gln Ser Ile Val Ser Ser Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 114
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
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<400> 114
Arg Ser Ser Gln Ser Ile Val His Trp Asn Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 115
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
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<400> 115
Arg Ser Ser Gln Ser Ile Val His Ser Tyr Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 116
<211> 16
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<213> Artificial Sequence

<220>
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<400> 116
Arg Ser Ser Gln Ser Ile Val His Ser Trp Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 117
<211> 16
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<220>

<223> synthetic antibody mutation

<400> 117
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Tyr Thr Tyr Leu Glu
1 5 10 15

<210> 118
<211> 16
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<213> Artificial Sequence

<220>
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<400> 118
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Asn Thr Tyr Phe Glu
1 5 10 15

<210> 119
<211> 16
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<213> Artificial Sequence

<220>
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<400> 119
Arg Ser Ser Gln Ser Ile Val His Ser Asn Gly Asn Thr Tyr Val Glu
1 5 10 15

<210> 120
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<400> 120
Ser Val Ser Asn Arg Phe Ser
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<210> 121
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<212> PRT
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<220>
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<400> 121

Lys Ala Ser Asn Arg Phe Ser
1 5

<210> 122
<211> 7
<212> PRT
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<220>
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<400> 122
Lys Val Ser Ser Arg Phe Ser
1 5

<210> 123
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<400> 123
Lys Val Ser Asn Leu Phe Ser
1 5

<210> 124
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<400> 124
Lys Val Ser Asn Arg Phe Trp
1 5

<210> 125
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<400> 125
Lys Val Ser Asn Arg Phe Phe
1 5

<210> 126
<211> 9
<212> PRT
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<220>
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<400> 126
Val Gln Gly Ser His Val Pro Trp Thr
 1   5

<210> 127
<211> 9
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<220>
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<400> 127
His Gln Gly Ser His Val Pro Trp Thr
 1   5

<210> 128
<211> 9
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<400> 128
Phe Arg Gly Ser His Val Pro Trp Thr
 1   5

<210> 129
<211> 9
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<220>
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<400> 129
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 1   5

<210> 130
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<400> 130
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1 5

<210> 131
<211> 9
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<220>
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<400> 131
Phe Gln Gly Trp His Val Pro Trp Thr
1 5

<210> 132
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<400> 132
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1 5

<210> 133
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<400> 133
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1 5

<210> 134
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<220>
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<400> 134
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 1   5

<210> 135
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<400> 135
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 1   5

<210> 136
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 1   5

<210> 137
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<400> 137
Phe Gln Gly Ser Gln Val Pro Trp Thr
 1   5

<210> 138
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<400> 138
Phe Gln Gly Ser His Thr Pro Trp Thr
1 5

<210> 139
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<400> 139
Phe Gln Gly Ser His Val Pro Trp Ala
1 5

<210> 140
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<400> 140
Phe Gln Gly Ser His Val Pro Trp Arg
1 5

<210> 141
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<400> 141
Phe Gln Gly Ser His Val Pro Trp His
1 5

<210> 142
<211> 9
<212> PRT
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<400> 142
Phe Gln Gly Ser His Val Pro Trp Lys
1 5

<210> 143
<211> 9
<212> PRT
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<220>
<223> synthetic antibody mutation

<400> 143
Phe Gln Gly Ser His Val Pro Trp Ile
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<210> 144
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<220>
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<400> 144
Asp Ile Trp Trp Asp Asp Asn Lys Tyr Thr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 145
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 145
Phe Gln Gly Ser His Phe Pro Trp Thr
1 5

<210> 146
<211> 16
<212> PRT
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<220>
<223> synthetic antibody mutation

<400> 146
Arg Ser Ser Gln Ser Ile Val His Ser Gln Gly Asn Thr Tyr Leu Glu
1 5 10 15

<210> 147

<211> 12
<212> PRT
<213> Artificial Sequence

<220>
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<400> 147
Gly Phe Ser Leu Ser Thr Pro Gly Met Gly Val Trp
 1   5   10

<210> 148
<211> 12
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<220>
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<400> 148
Gly Phe Ser Leu Ser Thr Pro Gly Met Gly Val Ala
 1   5   10

<210> 149
<211> 15
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<220>
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<400> 149
Arg Ser Ser Gln Ser Ile Val Ser Ser Trp Gly Asn Thr Tyr Leu
 1   5   10   15

<210> 150
<211> 15
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<220>
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<400> 150
Arg Ser Ser Gln Ser Ile Val Ser Ser Tyr Gly Asn Thr Tyr Leu
 1   5   10   15

<210> 151
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<400> 151
Arg Ser Ser Gln Ser Ile Val Ser Ser Gln Gly Asn Thr Tyr Leu
1 5 10 15

<210> 152
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<400> 152
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1 5 10 15

<210> 153
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<400> 153
Arg Ser Ser Gln Ser Ile Val Ser Ser Trp Gly Asn Thr Tyr Phe
1 5 10 15

<210> 154
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<400> 154
Glu Ile Asn Pro Asp Ser Ser Thr Ala Asn Tyr Thr Pro Ala Leu Lys
1 5 10 15
Asp

<210> 155
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<400> 155
Glu Ile Asn Pro Asp Ser Ser Thr Ala Asn Tyr Thr Pro Tyr Leu Lys
 1   5   10   15
Asp

<210> 156
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<400> 156
Glu Ile Asn Pro Asp Ser Ser Thr Ala Asn Tyr Thr Pro His Leu Lys
 1   5   10   15
Asp

<210> 157
<211> 17
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<400> 157
Lys Ser Ser Gln Ser Leu Leu Asn Trp Tyr Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 158
<211> 17
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<400> 158
Lys Ser Ser Gln Ser Leu Leu Asn Tyr Tyr Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 159
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<400> 159
Lys Ser Ser Gln Ser Leu Leu Asn Tyr His Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 160
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<223> synthetic antibody mutation

<400> 160
Lys Ser Ser Gln Ser Leu Leu Asn Arg Tyr Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 161
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 161
Lys Ser Ser Gln Ser Leu Leu Asn Trp His Asn Gln Lys Asn Tyr Leu
 1   5   10   15
Ala

<210> 162
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic antibody mutation

<400> 162
Glu Ile Asn Pro Asp Ser Ser Thr Val Asn Tyr Thr Pro Ser Leu Lys

1 5 10 15
Asp

<210> 163
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 163
tctctggaga tggtgaattt acgtactgct atctggatt 39

<210> 164
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 164
ctaagtagtt cttttggttg ttataacaga ctctggctgg a 41

<210> 165
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 165
tggagcctgg cggacccagg hcatccaata tctactaaag gtgaatccag a 51

<210> 166
<211> 65
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 166
tctctggaga tggtgaatyt atcctttagg gmtggcgtat agttggccgt actgctatct 60
ggatt 65

<210> 167
<211> 65
<212> DNA
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<220>
<223> Primer

<400> 167
tctctggaga tggtgaatyt atcctttagg trtggcgtat agttggccgt actgctatct 60
ggatt 65

<210> 168
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<220>
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<400> 168
ctaagtagtt cttttggttg trgtrgytta acagactctg gctgga 46

<210> 169
<211> 46
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<220>
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<210> 170
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<210> 171
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<220>
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<210> 172
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<210> 173
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<220>
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<400> 173
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<210> 174
<211> 40
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<220>
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<400> 174
cttctgcagg taccattcgt tatacaatgc tctgactaga 40

<210> 175
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
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<400> 175
tgggggctga cggatccacm acacacccat tccacragtg ctgagtgaga acccaga 57

<210> 176
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
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<400> 176
tgggggctga cggatccags ccacacccat tccacractg ctgagtgaga acccaga 57

<210> 177
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
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<400> 177
gctcttcaga gatgggttag vgtatttatt gtcatcccac 40

<210> 178
<211> 60
<212> DNA
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<220>
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<400> 178
cttctgcagg taccattcma aataggtgtt tccccaactc ratacaatgc tctgactaga 60

<210> 179
<211> 60
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<213> Artificial Sequence

<220>
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<210> 180
<211> 60
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<213> Artificial Sequence

<220>
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<210> 181
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
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<210> 182
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
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<210> 183
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
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<210> 184
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<212> DNA
<213> Artificial Sequence

<220>
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<400> 184
ttggtgctga tgttctgg 18

<210> 185
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 185
atcttcttgc tgttctgg 18

<210> 186
<211> 18
<212> DNA
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<220>
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<400> 186

tgggtgctgc tgctctgg 18

<210> 187
<211> 18
<212> DNA
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<220>
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<400> 187
gggctgcttg tgctctgg 18

<210> 188
<211> 18
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<220>
<223> Primer

<400> 188
ggaatcttgt tgctctgg 18

<210> 189
<211> 18
<212> DNA
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<220>
<223> Primer

<400> 189
rtrttsctgc tgctrtgg 18

<210> 190
<211> 18
<212> DNA
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<220>
<223> Primer

<400> 190
ggtctcctgt tgctctgt 18

<210> 191
<211> 18
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<220>
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<400> 191

atatttctac tgctctgt 18

<210> 192
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<220>
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<400> 192
gtcataatrt ccagagga 18

<210> 193
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<220>
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<400> 193
ctgagctgtg tattcct 17

<210> 194
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<220>
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<400> 194
ctcarmttga ttttcct 17

<210> 195
<211> 17
<212> DNA
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<220>
<223> Primer

<400> 195
tggrtcatst tcttcct 17

<210> 196
<211> 17
<212> DNA
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<220>
<223> Primer

<400> 196

tksrtctttc tcttcct 17

<210> 197
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 197
tgtatcatsc tcttctt 17

<210> 198
<211> 17
<212> DNA
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<220>
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<400> 198
tggrtctttc tcttttt 17

<210> 199
<211> 18
<212> DNA
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<220>
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<400> 199
ttaaacttgg gttttttct 18

<210> 200
<211> 17
<212> DNA
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<220>
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<400> 200
gkgctgytcy tctgcct 17

<210> 201
<211> 18
<212> DNA
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<220>
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<400> 201

ttaagtcttc tgtacctg 18

<210> 202
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<220>
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<400> 202
tcagtaactg caggtgtcca 20

<210> 203
<211> 20
<212> DNA
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<220>
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<400> 203
ttttaaaagg tgtccagtgt 20

<210> 204
<211> 20
<212> DNA
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<220>
<223> Primer

<400> 204
gcaacagcta caggtgtcca 20

<210> 205
<211> 20
<212> DNA
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<220>
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<400> 205
cagctacagr tgtccactcc 20

<210> 206
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<220>
<223> Primer

<400> 206

atttccaagc tgtgtcctgt cc 22

<210> 207
<211> 23
<212> DNA
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<220>
<223> Primer

<400> 207
ctcctgtcag gaactgcagg tgt 23

<210> 208
<211> 23
<212> DNA
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<220>
<223> Primer

<400> 208
cagtggttac aggggtcaat tca 23

<210> 209
<211> 21
<212> DNA
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<220>
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<400> 209
ctgttsacag cchttcckgg t 21

<210> 210
<211> 21
<212> DNA
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<220>
<223> Primer

<400> 210
ctgatggcag ctgcccaaag t 21

<210> 211
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
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<400> 211

tttatcaagg tgtgcattgt 20

<210> 212
<211> 27
<212> DNA
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<220>
<223> Primer

<400> 212
tcactggatg gtgggaagat ggataca 27

<210> 213
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 213
gacatttggg aaggactgac tctc 24

<210> 214
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 214
caggggctc tcgcaggaga cgag 24

<210> 215
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 215
atcttcttgc tgttctgggt atctggaacc tgtggg 36

<210> 216
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 216

ttggtgctga tgttctggat tcctgcttcc agcagt 36

<210> 217
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 217
gtggacgttc ggccaaggga ccaaggtgga aatcaaac 38

<210> 218
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 218
tgtacacttt tggccagggg accaagctgg agatcaaac 39

<210> 219
<211> 63
<212> DNA
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<220>
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<400> 219
attactacta ctactacggt atggacgtct ggggccaagg gaccacggtc accgtctcct 60
cag 63

<210> 220
<211> 27
<212> DNA
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<220>
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<400> 220
ttactcgctg cccaaccagc catggcc 27

<210> 221
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<220>
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<400> 221
gacagatggt gcagccacag t 21

<210> 222
<211> 27
<212> DNA
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<220>
<223> primer

<400> 222
ttactgttta cccctgtgac aaaagcc 27

<210> 223
<211> 21
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<220>
<223> primer

<400> 223
gaagaccgat gggcccttgg t 21

<210> 224
<211> 66
<212> DNA
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<220>
<223> primer

<221> misc_feature
<222> 44, 45
<223> n = A,T,C or G

<400> 224
cttggtcccc tggccaaaag tgtacggata actatgatca ttmnnacagt aataaactgc 60
cacatc 66

<210> 225
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 225
cttggtcccc tggccaaaag tgtacggata actatgatcm nnctgacagt aataaactgc 60

cacatc 66

<210> 226
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 38, 39
<223> n = A,T,C or G

<400> 226
cttggtcccc tggccaaaag tgtacggata actatgmnna ttctgacagt aataaactgc 60
cacatc 66

<210> 227
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 35, 36
<223> n = A,T,C or G

<400> 227
cttggtcccc tggccaaaag tgtacggata actmnnatca ttctgacagt aataaactgc 60
cacatc 66

<210> 228
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 32, 33
<223> n = A,T,C or G

<400> 228
cttggtcccc tggccaaaag tgtacggata mnnatgatca ttctgacagt aataaactgc 60
cacatc 66

<210> 229
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 29, 30
<223> n = A,T,C or G

<400> 229
cttggtcccc tggccaaaag tgtacggmnn actatgatca ttctgacagt aataaactgc 60
cacatc 66

<210> 230
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 26, 27
<223> n = A,T,C or G

<400> 230
cttggtcccc tggccaaaag tgtamnnata actatgatca ttctgacagt aataaactgc 60
cacatc 66

<210> 231
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

<400> 231
cttggtcccc tggccaaaag tmnncggata actatgatca ttctgacagt aataaactgc 60
cacatc 66

<210> 232
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 20, 21
<223> n = A,T,C or G

<400> 232
cttggtcccc tggccaaamn ngtacggata actatgatca ttctgacagt aataaactgc 60
cacatc 66

<210> 233
<211> 69
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 50, 51
<223> n = A,T,C or G

<400> 233
cgtggttcct tgcccccagt agtccatagc atcgtagtaa ccatcaacmn ntctcgcaca 60
gtaatacac 69

<210> 234
<211> 69
<212> DNA
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<220>
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<221> misc_feature
<222> 47, 48
<223> n = A,T,C or G

<400> 234
cgtggttcct tgcccccagt agtccatagc atcgtagtaa ccatcmnncg gtctcgcaca 60
gtaatacac 69

<210> 235
<211> 69
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<221> misc_feature
<222> 44, 45
<223> n = A,T,C or G

<400> 235
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gtaatacac 69

<210> 236
<211> 69
<212> DNA

<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 236
cgtggttcct tgcccccagt agtccatagc atcgtagtam nnatcaaccg gtctcgcaca 60
gtaatacac 69

<210> 237
<211> 69
<212> DNA
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<221> misc_feature
<222> 38, 39
<223> n = A,T,C or G

<400> 237
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gtaatacac 69

<210> 238
<211> 69
<212> DNA
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<220>
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<221> misc_feature
<222> 35, 36
<223> n = A,T,C or G

<400> 238
cgtggttcct tgcccccagt agtccatagc atcmnngtaa ccatcaaccg gtctcgcaca 60
gtaatacac 69

<210> 239
<211> 69
<212> DNA
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<221> misc_feature
<222> 32, 33

<223> n = A,T,C or G

<400> 239
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gtaatacac 69

<210> 240
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<221> misc_feature
<222> 29, 30
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<400> 240
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gtaatacac 69

<210> 241
<211> 69
<212> DNA
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<221> misc_feature
<222> 26, 27
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<400> 241
cgtggttcct tgcccccagt agtcmnnagc atcgtagtaa ccatcaaccg gtctcgcaca 60
gtaatacac 69

<210> 242
<211> 69
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<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

<400> 242
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gtaatacac 69

<210> 243

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<221> misc_feature
<222> 20, 21
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<400> 243
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gtaatacac 69

<210> 244
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<221> misc_feature
<222> 44, 45
<223> n = A,T,C or G

<400> 244
cttggtgccc tggccgaacg tccacggaac atgtgaacct tgmnngcagt aataaactcc 60
aacatc 66

<210> 245
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 245
cttggtgccc tggccgaacg tccacggaac atgtgaaccm nnaaagcagt aataaactcc 60
aacatc 66

<210> 246
<211> 66
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<221> misc_feature
<222> 38, 39
<223> n = A,T,C or G

<400> 246
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aacatc 66

<210> 247
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 35, 36
<223> n = A,T,C or G

<400> 247
cttggtgccc tggccgaacg tccacggaac atgmnnacct tgaaagcagt aataaactcc 60
aacatc 66

<210> 248
<211> 66
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<221> misc_feature
<222> 32, 33
<223> n = A,T,C or G

<400> 248
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aacatc 66

<210> 249
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 29, 30
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<400> 249
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aacatc 66

<210> 250
<211> 66
<212> DNA
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<221> misc_feature
<222> 26, 27
<223> n = A,T,C or G

<400> 250
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aacatc 66

<210> 251
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

<400> 251
cttggtgccc tggccgaacg tmnncggaac atgtgaacct tgaaagcagt aataaactcc 60
aacatc 66

<210> 252
<211> 66
<212> DNA
<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 20, 21
<223> n = A,T,C or G

<400> 252
cttggtgccc tggccgaamn nccacggaac atgtgaacct tgaaagcagt aataaactcc 60
aacatc 66

<210> 253
<211> 75
<212> DNA
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<220>

<223> primer

<221> misc_feature
<222> 56, 57
<223> n = A,T,C or G

<400> 253
cgtggttcct tgcccccagt agtccatagc atagtagggg ttaccatagt tagcmnntcg 60
agcacagtaa tacgt 75

<210> 254
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 53, 54
<223> n = A,T,C or G

<400> 254
cgtggttcct tgcccccagt agtccatagc atagtagggg ttaccatagt tmnntcttcg 60
agcacagtaa tacgt 75

<210> 255
<211> 75
<212> DNA
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<220>
<223> primer

<221> misc_feature
<222> 50, 51
<223> n = A,T,C or G

<400> 255
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agcacagtaa tacgt 75

<210> 256
<211> 75
<212> DNA
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<220>
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<221> misc_feature
<222> 47, 48
<223> n = A,T,C or G

<400> 256

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agcacagtaa tacgt 75

<210> 257
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 44, 45
<223> n = A,T,C or G

<400> 257
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agcacagtaa tacgt 75

<210> 258
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 258
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agcacagtaa tacgt 75

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<222> 38, 39
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agcacagtaa tacgt 75

<210> 260
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agcacagtaa tacgt 75

<210> 261
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<221> misc_feature
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agcacagtaa tacgt 75

<210> 262
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<223> n = A,T,C or G

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agcacagtaa tacgt 75

<210> 263
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<221> misc_feature
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<223> n = A,T,C or G

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agcacagtaa tacgt 75

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<400> 264
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<223> n = A,T,C or G

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<222> 29, 30
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<210> 272
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<221> misc_feature
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<400> 272
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<210> 273
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<221> misc_feature
<222> 20, 21
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<400> 273
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<210> 274
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<221> misc_feature
<222> 44, 45
<223> n = A,T,C or G

<400> 274
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gct 63

<210> 275
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<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 275
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gct 63

<210> 276
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<221> misc_feature
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<400> 276
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gct 63

<210> 277
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<221> misc_feature
<222> 35, 36
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gct 63

<210> 278
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<210> 280
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gct 63

<210> 281
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<223> n = A,T,C or G

<400> 281
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gct 63

<210> 282
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<221> misc_feature
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<400> 282
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gct 63

<210> 283
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<222> 38, 39
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<210> 284
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<210> 285
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<221> misc_feature
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<400> 287
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<210> 288

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<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

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<210> 289
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<221> misc_feature
<222> 20, 21
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<210> 290
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<220>
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<221> misc_feature
<222> 32, 33
<223> n = A,T,C or G

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<210> 291
<211> 51
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<221> misc_feature
<222> 29, 30
<223> n = A,T,C or G

<400> 291
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<210> 292
<211> 51
<212> DNA
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<220>
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<221> misc_feature
<222> 26, 27
<223> n = A,T,C or G

<400> 292
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<210> 293
<211> 51
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<220>
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<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

<400> 293
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<210> 294
<211> 51
<212> DNA
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<220>
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<221> misc_feature
<222> 20, 21
<223> n = A,T,C or G

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<210> 295
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<221> misc_feature
<222> 44, 45
<223> n = A,T,C or G

<400> 295
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ccctttc 67

<210> 296
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<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 296
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ccctttc 67

<210> 297
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<221> misc_feature
<222> 38, 39
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<400> 297
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ccctttc 67

<210> 298
<211> 67
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<220>
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<221> misc_feature
<222> 35, 36
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<400> 298

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ccctttc 67

<210> 299
<211> 67
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<221> misc_feature
<222> 32, 33
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<400> 299
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ccctttc 67

<210> 300
<211> 67
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<221> misc_feature
<222> 29, 30
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ccctttc 67

<210> 301
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<221> misc_feature
<222> 26, 27
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ccctttc 67

<210> 302
<211> 67
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<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

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tagagatggc gtatagttta tmnnactgct atctggattt atttcgccaa yccactccag 60
ccctttc 67

<210> 303
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<221> misc_feature
<222> 20, 21
<223> n = A,T,C or G

<400> 303
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ccctttc 67

<210> 304
<211> 67
<212> DNA
<213> Artificial Sequence

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<221> misc_feature
<222> 48, 49
<223> n = A,T,C or G

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tatctgg 67

<210> 305
<211> 67
<212> DNA
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<221> misc_feature
<222> 45, 46
<223> n = A,T,C or G

<400> 305
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tatctgg 67

<210> 306
<211> 67
<212> DNA
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<221> misc_feature
<222> 42, 43
<223> n = A,T,C or G

<400> 306
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tatctgg 67

<210> 307
<211> 67
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<221> misc_feature
<222> 39, 40
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<400> 307
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tatctgg 67

<210> 308
<211> 67
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<221> misc_feature
<222> 36, 37
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tatctgg 67

<210> 309
<211> 67

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<221> misc_feature
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tatctgg 67

<210> 310
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<210> 311
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<222> 27, 28
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<210> 312
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<221> misc_feature

<222> 41, 42
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<400> 312
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<400> 318
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<221> misc_feature
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<400> 332
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<210> 333
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<221> misc_feature
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<400> 333
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<210> 334

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<221> misc_feature
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<400> 334
gaacctgtct gggactccmn naaaccggtt ggaaacttta tagatcagga gctgtgg 57

<210> 335
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<220>
<223> primer

<221> misc_feature
<222> 38, 39
<223> n = A,T,C or G

<400> 335
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<210> 336
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<221> misc_feature
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<400> 336
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<221> misc_feature
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<400> 337
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<221> misc_feature
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<400> 339
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<210> 340
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<400> 340
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<210> 341
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<210> 342
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<221> misc_feature
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<223> n = A,T,C or G

<400> 342
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<220>
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<221> misc_feature
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<223> n = A,T,C or G

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<210> 345
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<210> 346
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<210> 347
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<210> 349
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<210> 350
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<221> misc_feature
<222> 41, 42
<223> n = A,T,C or G

<400> 350
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<210> 351
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<210> 352
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<223> n = A,T,C or G

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<221> misc_feature
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<210> 354
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<213> Artificial Sequence

<220>
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<221> misc_feature
<222> 29, 30
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<211> 60
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<220>
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<221> misc_feature
<222> 26, 27
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<400> 355
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<210> 356
<211> 60
<212> DNA
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<220>
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<221> misc_feature
<222> 23, 24
<223> n = A,T,C or G

<400> 356
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<210> 357
<211> 60
<212> DNA
<213> Artificial Sequence

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<221> misc_feature
<222> 20, 21
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<400> 357
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<210> 358
<211> 9
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<213> Artificial Sequence

<220>
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<400> 358
Phe Gln Ser Ser His Phe Pro Trp Thr
1 5